Conergy ISA configurator

Operating manual

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1 Introduction

1.1 Short description

The Conergy ISA configurator is an operating element for monitoring and controlling a standalone inverter Conergy ISA 3000/5000/10k/20k/30k hybrid or a standalone inverter Conergy ISA 3000/5000 backup.

Using the Conergy ISA configurator, you can monitor your inverter. The Conergy ISA configurator reads in the operating data of the inverter and processes these data for presentation on its display. You can also use the Conergy ISA configurator to optimise the action between inverter, battery and diesel generator. To make these changes in settings, you need the characteristics of your battery and diesel generator. Please obtain these data from the technical data sheets of the battery and diesel generator or ask the manufacturer.

Please note that the action between inverter, battery and diesel generator is sensitive, and a single change in data always has effects on the entire system. In case of unclarity, please contact Conergy Service or the manufacturer of the battery or diesel generator immediately.

1.2 User group

These operating instructions are oriented towards an electrical specialist appointed by the owner/operator.

1.3 Signposts

The following will assist you in finding your way around these operating instructions:

Headers The headers display the heading of the current chapter.

Footers The footers display the name of the product, the name of the document, and the page number.

Text markups Labels of the LED displays and connections appear printed in **bold.** Item numbers are depicted in the form [1] and [2]. Display texts are printed in a `different font.` Names of companies other than Conergy are printed in *italics*.

Fold-out graphic The structures of the two main menus `Measurements` (Messdaten) and `Settings` (Einstellung) of the Conergy ISA configurator are depicted on the fold-out graphic at the end of the of the operating instructions.

Symbols

Start of a procedure with description of the goal of the procedure.

Individually numbered steps follow, which may be interrupted by background information, illustrations, or warnings.

Background and additional information or the status of a procedure. Appears between the steps of a procedure or within the course of a procedure.

1.4 Duties of the owner/operator

Conversion work on the facilities and devices of Conergy AG may only be performed by service technicians from Conergy AG.

The operating instructions are part of the product. If the contents of these operating instructions and the safety instructions and step-by-step usage instructions in particular are not observed and followed, the product warranty and liability for damages may be rendered void. Conergy shall not be held liable for damages arising from a failure to observe and follow the operating instructions or any improper use of the device.

1.5 Environmental information

The Conergy ISA configurator is made from materials of which almost all can be used again through raw materials recycling. The device, its accessories, and its packaging should therefore be recycled in an environmentally responsible manner.

1.6 Manufacturer information

Manufacturer Conergy AG

www.conergy.com

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Conergy AG, 2006

1.7 Standards and technical directives

The Conergy ISA configurator complies with the following standards and guidelines:

- 89/336/EC: Directive of the Council on the harmonisation of the laws of the member states relating to electromagnetic compatibility (amended by 93/97/EC)
- 73/23/EC: Directive of the Council on the harmonisation of the laws of the member states relating to electrical equipment designed for use within certain voltage limits (amended by 93/68/EC)
- DIN EN 60950-1: Information technology equipment – Safety, General requirements
- DIN EN 61000-6-1:2001 Electromagnetic compatibility (EMC) Generic standards: immunity for residential, commercial and light industrial environments
- DIN EN 61000-6-2:2001 Electromagnetic compatibility (EMC) Generic standards: immunity for industrial environments
- DIN EN 61000-6-3:2001 Electromagnetic compatibility (EMC) Generic standards: emission standard for residential, commercial and light industrial environments
- DIN EN 61000-6-4: Electromagnetic compatibility (EMC) Generic standards: emission standard for industrial environments

2 Safety

The safety instructions and warnings form an essential part of these instructions and are of fundamental importance when handling the device. The Conergy ISA configurator complies with all design-relevant safety requirements and tests stipulated by applicable standards.

The owner/operator is obliged to ensure the safe operation of the Conergy ISA configurator in accordance with statutory regulations and with the safety instructions stated in these operating instructions. The electrical specialist appointed by the owner/operator must observe and follow all safety instructions named in these operating instructions. Before fitting, installation, commissioning or dismanting of a Conergy ISA configurator, the electrical specialist must have completely read and understood these operating instructions.

2.1 Basic safety instructions

Before starting any work on electrical systems, the following safety rules must always be followed:

- Disconnect
- Secure to prevent switching back on
- Verify that device or system has zero voltage
- Earth and short circuit the device or system
- Cover adjacent live parts

In addition, follow the following general safety instructions:

- Do not remove any safety devices and do not disable any safety devices.
- Keep a copy of this instruction manual in the immediate vicinity of the device.
- Work on the device may only be carried out by authorised and sufficiently qualified personnel.

2.2 Warnings

The warnings used in these operating instructions indicate information important for safety. They consist of the following:

- the warning symbol (pictogram)
- a signal word indicating the level of risk,
- information on the hazard and
- steps to avoid the danger.

The warnings appear in three levels of risk, depending on the nature of the hazard:

DANGER!

This safety instruction indicates an unusually high level of immediate risk when handling the device. Ignoring this notice leads to serious injuries or death.

- Steps to avoid the danger.

WARNING!

This safety instruction indicates a potentially dangerous situation which can result in moderate or slight bodily injuries or damage to property.

- Steps to avoid the danger.

CAUTION!

This safety instruction is used as a warning about possible damage and relates to safety, malfunctions and protection of property.

- Steps to avoid the danger.

3 Product description

3.1 Connection and control elements

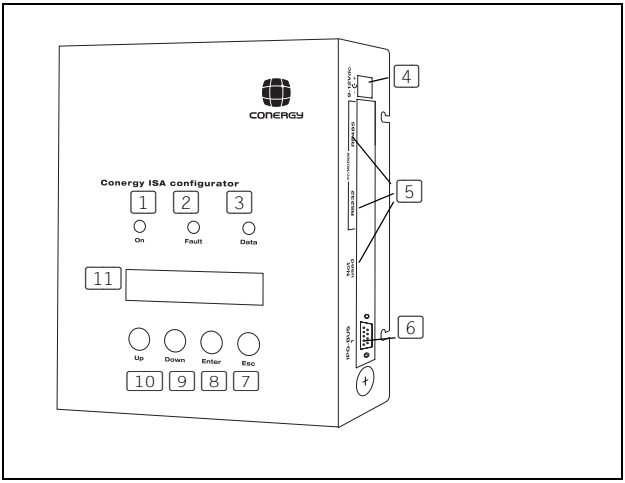


Fig. 3-1: Conergy ISA configurator

1 **LED display On**

Indicates that the Conergy ISA configurator is ready for operation

2 **LED display Fault**

Flashing:

The Conergy ISA configurator recognises a fault within the standalone system, e.g. excess temperature of the battery or output stage.

Permanently lit:

In case of interrupted communication with the connected standalone inverter (e.g. due to a cable break)

[3] **LED display Data**

Flashing:

Indicates data transfer via the interface (Item [f]).

[4] **9-12 V_{DC} connection**

Power supply socket for the supplied plug-in power adapter

[5] **Not used**

[6] **ISA bus (IPG bus)**

Interface with the Conergy ISA standalone inverter

[7] [Esc] **(cancel/back)**

Change to the next higher menu level or cancel a change

[8] [Enter] **(entry/confirmation)**

Confirm the current menu option or the current setting; change to the next lower menu level or into the entry mode

[9] [Down] **(previous item/value)**

Scroll within a menu level or move the cursor in the display text and change the setting values

[10] [UP] **(next item/value)**

Scroll within a menu level or move the cursor in the display text and change the setting values

[11] **Display**

Shows 2 LCD lines, each with 16 characters

3.2 Power supply

If you connect the Conergy ISA configurator with a single-phase Conergy ISA standalone inverter (3000/5000/10k hybrid or 3000/5000 backup) over the 1:1 cable, then the power supply to the Conergy ISA configurator runs over the standalone inverter. If the inverter is switched on and supplies its own control electronics, it can supply the Conergy ISA configurator with power. If a public grid is available, connect the Conergy ISA configurator with the supplied plug-in power adapter as a precaution.

If you connect the Conergy ISA configurator with a three-phase Conergy ISA standalone converter (20k hybrid or 30k hybrid), power to the Conergy ISA configurator must be supplied over the public grid or the grid that supplies the consumers (load). Power cannot be supplied via the connected standalone inverter.

3.3 Communication

If you connect the Conergy ISA configurator with a single-phase Conergy ISA standalone inverter (3000/5000/10k hybrid or 3000/5000 backup), you can use the supplied 1:1 cable. Communication takes place according to the RS232 standard.

If you connect the Conergy ISA configurator with a triple-phase Conergy ISA standalone inverter (20k hybrid or 30k hybrid), you can use a multipolar, screened cable. You have to adapt this to the RS232 standard. Conergy supplies you a SUB-D-D terminal adapter for the adaptation.

The Conergy ISA configurator recognises the cable used and the connected standalone inverter.

3.4 Storage

At each system start, the Conergy ISA configurator overwrites the standard values (factory settings) of the inverter. The Conergy ISA configurator has non-volatile storage in which the settings are filed. If you disconnect the Conergy ISA configurator from the standalone inverter and the inverter shuts off during this time, the inverter resets its standard values. In this case, the values you set using the Conergy ISA configurator are overwritten.

The Conergy ISA configurator stores only the settings, which you will find in the main menu `Settings` . The measurement data are neither saved nor output. You can see the current measurement data in the main menu `Measurements`.

3.5 Switch-on time

You can connect the Conergy ISA configurator to the standalone inverter at any time, regardless of whether the standalone inverter is switched on or off.

If you use acid batteries (liquid), you have to correctly set the BOOST DIP switch of the inverter. You can obtain details and standard settings from the operating instructions of the Conergy ISA hybrid or backup standalone inverter.

4 Installation and commissioning

4.1 Included in delivery

- Conergy ISA configurator
- Plug-in power adapter
- 1:1 cable with two 9-pin Sub-D connectors (Length 1.80 m)
- SUB-D terminal adapter for 9-pin SUB-D female connector (For conversion to the RS485 standard)
- Plugs and screws for wall mounting
- Operating instructions
- Drill template

4.2 Installation

Required material

For wall mounting, you need:

- Drill template (not included)
- 2 plugs and 2 screws (included)
- Suitable screwdriver
- Drill

External dimensions

The Conergy ISA configurator has the external dimensions:

W x H x D 140 x 170 x 40 mm

Indoor use

The Conergy ISA configurator is solely designed for use in indoor areas and must be protected from moisture. When moved from a cold environment to room temperature, condensation can form. In this case, the device must be allowed to adapt to the temperature of the room of operation for about two hours before connecting it.

Temperature

The temperature of the installation site should be between 0 and 40 °C.

4.3 Connecting to a single-phase Conergy ISA hybrid or backup standalone inverter

Every single-phase Conergy ISA (3000/5000/10k hybrid or 3000/5000 backup) standalone inverter has a databus interface. The interface is designed as a 9-pin SUB-D female connector. The Conergy ISA configurator is connected to a single-phase Conergy ISA hybrid or backup standalone inverter via the supplied 1:1 cable.

WARNING! Damage due to wrong connection!

The interface to the Conergy ISA standalone inverter can be damaged if connected to other external devices or to a PC. The electrical configuration, signal levels and ISA bus data protocol are device-specific and are not compatible with products made by other manufacturers.

| Check the correct connection of the interface!

You can connect the Conergy ISA configurator to a Conergy ISA hybrid or backup standalone inverter regardless of whether the inverter is switched on or not.

Connecting to the inverter

1. Open the front door of your single-phase standalone inverter with the key for the device.

   The interface is located to the left, above the LV HRC disconnectors for battery and solar generator.

2. Plug one end of the cable only into the intended interface.
3. Tighten the plug.

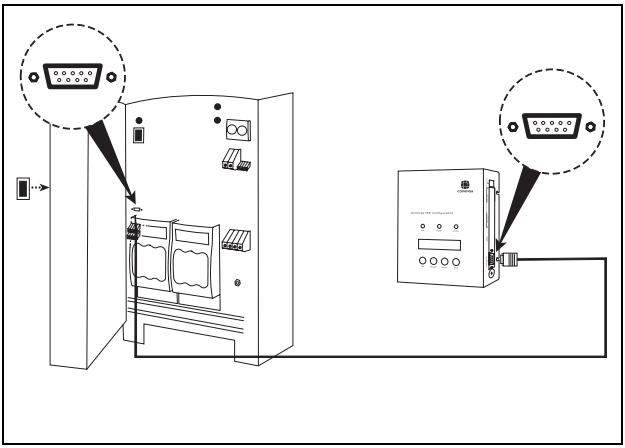


Fig. 4-1: Single-phase Conergy ISA standalone inverter and Conergy ISA configurator

4. Fasten the cable to the cable support rail of the inverter to relief strain for.
5. Close the front door of the inverter.
6. Plug the other end of the cable into the interface of the Conergy ISA configurator.

4.4 Connecting to a triple-phase Conergy ISA hybrid standalone inverter

Every triple-phase Conergy ISA 20k hybrid or 30 k hybrid standalone inverter has a databus interface. The interface is designed as a 9-pin SUB-D female connector with terminal adapter. The interface is located on the underside of the control cabinet.

Connection of the Conergy ISA configurator to a three-phase Conergy ISA standalone inverter is made via at least one shielded and multipolar cable following the RS485 standard. Conergy supplies you a SUB-D terminal adapter for the adaptation. The terminal adapters are equipped with installation material and junction cells. A small electrician's screwdriver is needed for installation.

WARNING! Damage due to wrong connection!

The interface to the Conergy ISA standalone inverter can be damaged if connected to other external devices or to a PC. The electrical configuration, signal levels and ISA bus data protocol are device-specific and are not compatible with products made by other manufacturers.

| Check the correct connection of the interface!

Installing SUB-D terminal adapter to a 4-pin pole cable

1. Move the cable down about 2 cm.
2. Strip the cable ends about 3 mm.
3. Attach wire a to pin 2, wire b to pin 6; shield/earth to pin 7.

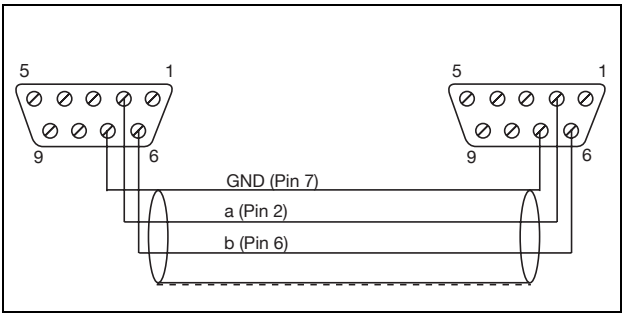


Fig. 4-2: ISA bus cable segment

Note the torque of the slotted screw, max. 0.05 Nm!

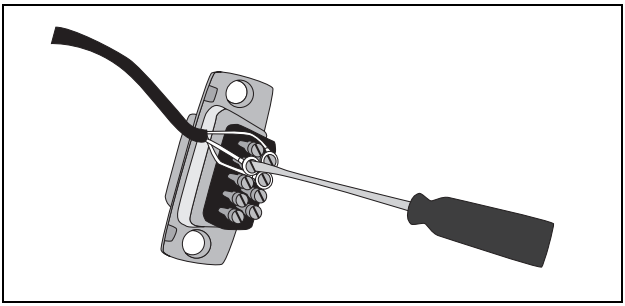


Fig. 4-3: Connect cable to terminal adapter

4. Screw on the hood for the SUB-D terminal adapter.
5. Mount the second terminal adapter to the other cable end in the same way.

You can connect the Conergy ISA configurator to a Conergy ISA hybrid standalone inverter regardless of whether the inverter is switched on or not.

Connecting to the inverter

1. Open the front door of your three-phase standalone inverter with the key for the device.

   The interface is located on the underside of the control cabinet.

2. Plug one end of the cable only into the intended interface.
3. Tighten the plug.

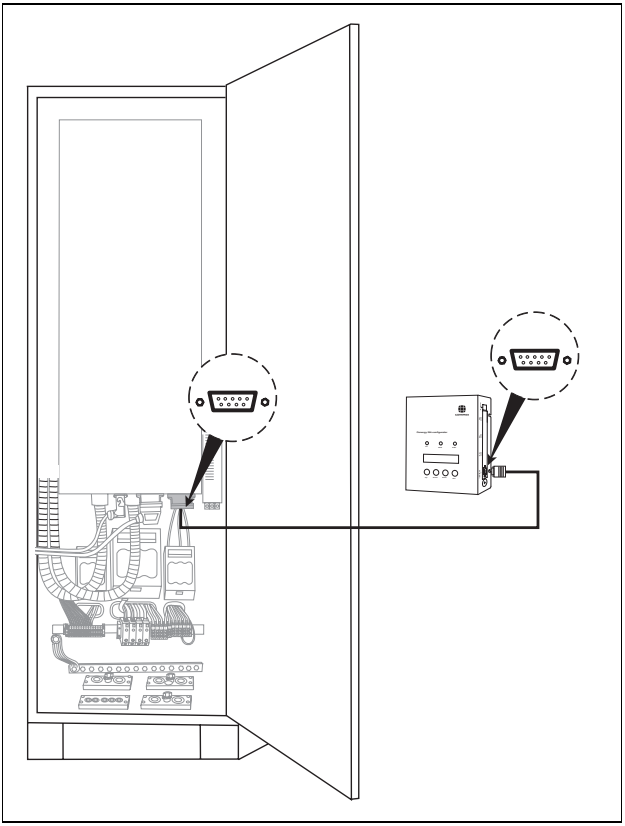


Fig. 4-4: Triple-phase Conergy ISA hybrid standalone inverter and Conergy ISA configurator

4. Fasten the cable to the cable support rail of the inverter strain relief.
5. Close the front door of the inverter.
6. Plug the other end of the cable into the interface of the Conergy ISA configurator.

4.5 Commissioning

Requisites

- Conergy ISA configurator is supplied with power.
- Standalone inverter is in operation.
- Conergy ISA configurator is connected to the standalone inverter.

You can tell that the Conergy ISA configurator is ready for operation when the left LED display **On** is lit and the flashing of the right LED diplay data (every 10 sec), if you have previously connected the Conergy ISA configurator to the inverter and it is switched on.

When commissioning, the following displays appear:

```
Conergy ISA configurator
com?
```

```
Conergy ISA configurator
V2.0x-0xxx0x
```

These displays are shown until the Conergy ISA configurator recognises a standalone inverter. If these displays repeat themselves cyclically over a longer period of time, check the connection to the inverter.

When the Conergy ISA configurator recognises the inverter, the following display appears briefly:

```
Conergy AG ISA back 3k/48
V2.0x-0xxx0x
```

The upper row shows the connected inverters and the nominal voltage of the battery. The decimal place in the lower row before the hyphen specify the version number of the Conergy ISA configurator.

5 Operation

Requisites

- Conergy ISA configurator is supplied with power.
- Standalone inverter is in operation.
- Conergy ISA configurator is connected to the standalone inverter.

You can tell that the Conergy ISA configurator is ready for operation when the left LED display **On** is lit and the right LED display data is flashing (every 10 sec). After the configurator is switched on, the starting point (root) of the menu structure will appear:

```
ISA back 3k/48
<>? Measurements
```

The display of the Conergy ISA configurator always consists of two lines. The lines of the start display have the following meaning:

Top line Type code of the connected Conergy inverter

Bottom line Current menu

<>? symbolises the display mode

The Conergy ISA configurator consists of two main menus:

- Measurements
- Settings

With the [UP] and [Down] keys, you can switch between both possibilities; with the [Enter] key, you confirm the chosen main menu, e.g. Settings:

```
ISA back 3k/48
<>? Settings
```

Under the main menu Measurements, you will find the current measurement data of the inverter, battery and solar generator. The precision of the measurement data is ± 2%.

In the main menu Settings, you can change the voltage thresholds, times and temperature values that control the interplay action between inverter, battery and diesel generator.

In the menu structure, you navigate with the keys:

Key	Assignment
Enter	Confirm current menu option; Change to the next higher menu level or into the entry mode
Esc	Change to the next higher menu level
Down	Scroll within a menu level
UP	Scroll within a menu level

With Down and UP, you scroll in different directions:

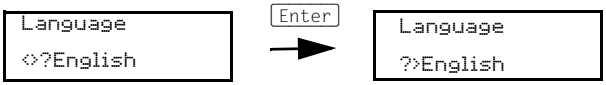
Down	previous item/value
UP	next item/value

5.1 Language setting of the display

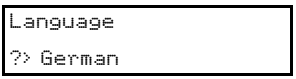
The display text of the Conergy ISA configurator can be shown in German or English. The factory setting is English.

Change from English to German

1. Using the Enter key, switch to the main menu Settings
2. Type UP or Down until you reach the sub-menu configurator.
3. Press Enter twice

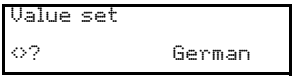


4. Press UP

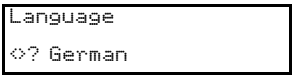


5. Press Enter

Confirmation of the change is displayed briefly:



Then the menu option appears with the changed setting:



You have confirmed the change of the language setting from English to German; now the display text appears in German.

5.2 Main menu: Measurements

The Conergy ISA configurator displays the following measurement data of the connected ISA hybrid or Conergy ISA backup:

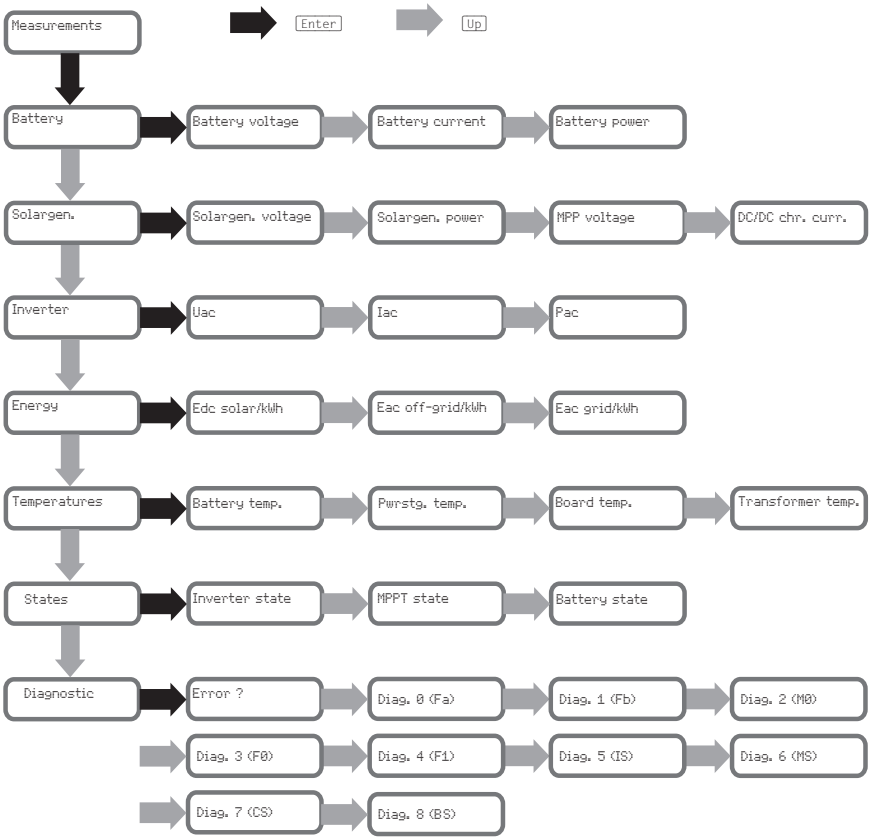


Fig. 5-1: Menu structure `Measurements`

Statements in the sub-menu `Diagnostic` are only of interest for Conergy Service. Please specify the listed error codes in case of servicing.

5.3 Main menu: Settings

In the main menu Settings, you can change the data and thus optimise the interplay action between inverter, battery and diesel generator according to your requirements. The inverter works with standard values set at the factory; you will find these in the appendix to the operating instructions. At each system start, the Conergy ISA configurator overwrites the standard values of the inverter.

First, you will receive an overview of the menu structure of the main menu Settings. The individual sub-menus are presented and explained. The options of each sub-menu are summarised in tabular form with a short explanation.

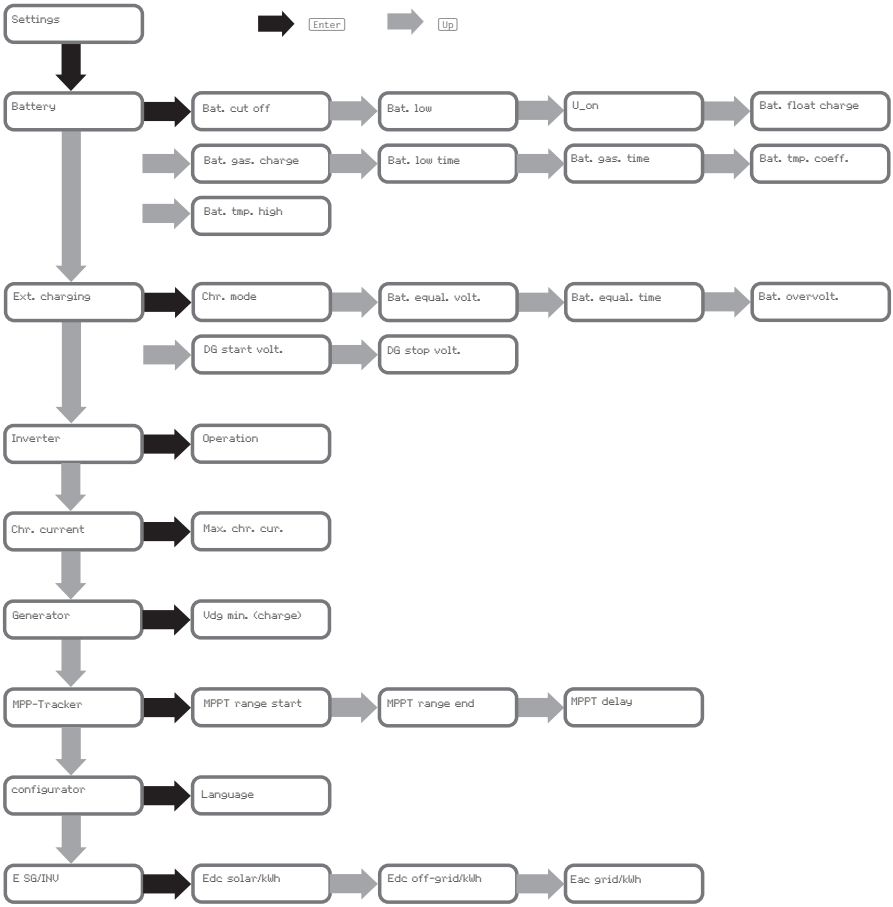


Fig. 5-2: Menu structure `Settings`

The following diagram depicts the minimum and maximum values of the voltage thresholds Bat. cut off, Bat. low, U on, Bat. float charge, Bat. gas. charge for the standalone inverter ISA 3000 hybrid with a 48 V battery. The vertical line in the respective bar specifies the standard value (factory setting) of the Conergy ISA configurator. The standard value of the voltage threshold for switching off the battery equals the minimum adjustable value.

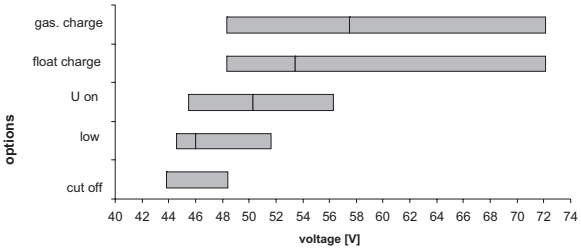
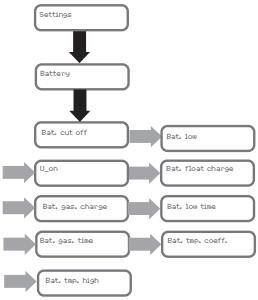


Fig. 5-3: Voltage threshold of the Conergy ISA 3000 hybrid with a 48 V battery



The battery is typically kept at the voltage threshold Bat. float charge (Battery trickle charge); at this voltage, the battery is considered "loaded". If more energy is taken than loaded, the battery begins to discharge. This discharge process can continue up to the voltage threshold Bat. cut off, then the inverter is switched off. For this to occur, the battery must have fallen below the voltage threshold Bat. cut off for the duration of Bat. low time. The Bat. low time ensures that the battery is not switched off immediately when the voltage drops due to short-term switching on of new loads.

The voltage threshold Bat. low lies above the threshold Bat. cut off. If the voltage reaches this threshold, an internal remark is set. This remark ensures that, at the next charging possibility, the battery is charged up to the voltage threshold Bat. gas. charge and this value is held for the duration of Bat. gas time. This process has a positive effect on the battery and extends its life.

If the battery can be charged before the voltage threshold Bat. low has been reached, the voltage climbs briefly to the threshold Bat. gas. charge (Battery gassing voltage) and then drops immediately to the voltage threshold Bat. float charge (Battery trickle charge).

The following diagram shows the charging procedure for a battery. First, the battery voltage rises to the gassing voltage and then drops immediately to the voltage threshold Bat. float charge. The dotted line shows the process when the battery voltage has reached the voltage threshold Bat. low. In this case, the battery is charged up to the threshold Bat. gas. charge; this voltage is maintained for the duration of Bat. gas time.

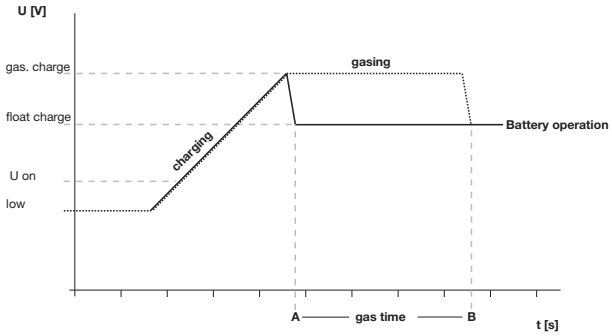


Fig. 5-4: Charging process of a battery

Inverter hybrid If the battery voltage drops to the value U on, the Conergy ISA hybrid standalone inverter switches on the diesel generator. This then takes over supplying power to the load and battery. The diesel generator is only switched off when the battery voltage reaches the voltage threshold Bat. float charge and the battery is charged.

Inverter backup The threshold at which the Conergy ISA backup switches from feed-in-mode to stand-by mode is above the threshold U on. For 48 V batteries, the feed-in threshold is about 1.5 V and for 120 V batteries about 3 V above U on. If the voltage of the battery falls below this voltage threshold, the Conergy ISA backup standalone inverter stops the feed-in mode. If the voltage returns above this voltage threshold, the inverter starts feeding into the grid again.

The voltage thresholds for the batteries must be separated by at least 1 V.

All named voltage thresholds are subject to temperature-dependent fluctuations. To compensate for these, you can enter the temperature coefficients of your battery (Bat. tmp. co-

eff.). If the battery exceeds the threshold Bat. tmp. high, the inverter is deactivated, including the integrated charge controller. This means the inverter no longer controls the battery's charging process. The battery is no longer charged.

If you want to change the values of the voltage thresholds Bat. float charge and Bat. gas. charge , you also have to adjust the value of the voltage threshold Bat. overvolt. accordingly. The standalone inverter immediately switches off the battery when the voltage threshold Bat. overvolt. is exceeded. You have to adapt this voltage threshold, since otherwise your changes are not effective. You will find the voltage threshold Bat. overvolt. in the sub-menu Ext. charging.

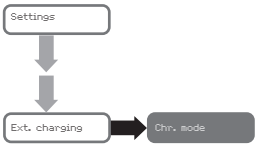
ATTENTION! Danger to the battery due to incorrect voltage thresholds!

Before you change the voltage threshold Bat. float charge, Bat. gas. charge and Bat. overvolt. , contact the battery manufacturer.

Incorrect voltage thresholds Bat. float charge, Bat. gas. charge and Bat. overvolt. **may damage your battery**.

Display text	Function
Bat. cut off (Shut down battery)	Voltage threshold at which the standalone inverter shuts down due to battery undervoltage.
Bat. low (Low battery)	Causes an internal remark to charge the battery up to the gassing charge at the next charging opportunity.
U on	Threshold at which the Conergy ISA hybrid inverter switches on the diesel generator; Threshold at which the Conergy ISA backup inverter switches between stand-by and feed-in mode
Bat. float charge (Battery trickle charge)	Voltage level (loaded battery)
Bat. gas. charge (Battery voltage at start of gassing)	Voltage is higher than the threshold Bat. float charge; positive effect on the battery

Display text	Function
Bat. low time (Battery switch-off time)	Time delay until voltage below the threshold Bat. cut off results in the battery shutting down
Bat. gas time (Battery gassing time)	Time in which the voltage threshold Bat. float charge is maintained
Bat. tmp. coeff. (Battery temporary coefficient)	Coefficient for correction of the voltage thresholds
Bat. tmp. high (Battery excess temperature)	Permissible maximum temperature; exceeding this temperature causes the inverter, including the charge controllers, to shut down



In the sub-menu Ext. charging (Extended charging) and within the option Chr. mode (Charging mode), you can use Enter and Up or Down to choose between various charging modes:

| Restart

| Peak charge (Charge completely)

| Float charge (Maintenance charge)

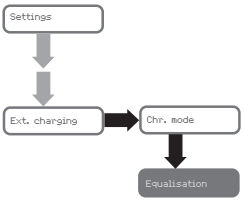
| Gassing (Gassing charge)

| Start equal. (Start equalisation)

| Equalisation (Equalisation)

| Disch w/o SG (Discharge without solar generator)

| Disch w. SG (Discharge with solar generator)

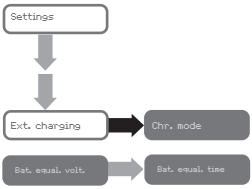


When lead batteries age, the composition of the electrolyte changes as does the surface of the lead plates; they float. Lead sulfate, which is normally dissolved in the sulfuric acid, deposits on the lead plates. The sulfate forms a "sponge", which can be regenerated only to a limited extent. The sulfate formation and precipitation diminishes the electrical activity of the surface and the porosity of the electrode. This process is called sulfating. If the battery discharges further, sulfate continues to form, which sets itself in sponges on existing deposits. The larger this sponge collection grows, the more improbable desulfation becomes.

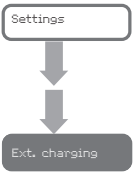
If your battery sulfates, this can have various causes. For example, the battery can be very old or, in relationship to the connected solar generator, overdimensioned. Large batteries do not receive enough voltage from solar generators that are too small, so they can never gas. Gassing counteracts sulfating in that gases move the sulfuric acid; sulfate then dissolves better in the acid. Equalisation can free the electrodes from the sulfate sponges. It is an emergency measure for regenerating the battery. The voltage threshold Bat. gas. charge (Battery gassing charge) is thereby intentionally exceeded for a defined time period Bat. equal. time (Bat. equalisation time) in order to clean the lead plates.

ATTENTION! Uncontrolled equalisation damages the battery!

Begin equalisation only after checking with the battery manufacturer!

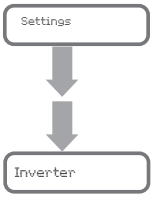


In the sub-menu Ext. charging (Extended charging) and within the options Bat. equal. volt. (Battery equalisation voltage) and Bat. equal. time (Battery equalisation time), you can enter the equalisation limits with that the battery manufacturer provided you. After entering them, start equalisation by selecting the mode Start equalisation under the option Chr. mode (Charge mode) Equalisation can only be started manually - not automatically.

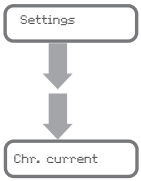


Display text	Function
Chr. mode (Charge mode)	Choice of various charge modi
Bat. equal. volt. (Battery equalisation voltage)	Comparable with the voltage threshold Bat. gas. charge.
Bat. equal. time (Battery equalisation time)	Time in which the voltage threshold Bat. equal. volt. is maintained
Bat. overvolt. (Battery excess voltage)	Maximum voltage for the battery; when the threshold is exceeded, the system is switched off, since otherwise the battery may get damaged.

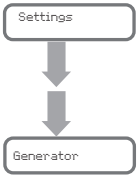
Display text	Function
DG start volt. (Diesel generator start-up voltage)	Battery voltage for switching on the diesel generator in order to | drive the load and | charge the battery
DG stop volt. (Diesel generator stop voltage)	Battery voltage for switching off the diesel generator in order to drive the load via inverters.



Display text	Function
Operation (Manual operation)	Manual control to switch the inverter on or off



Display text	Function
Max. chr. cur. (Maximum charge current)	Maximum permissible charging current of the battery



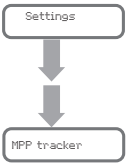
When the diesel generator has been switched on in order to take over power supply to the consumers, the inverter is driven backwards to charge the battery. This process adds additional load to the diesel generator; its output voltage can drop correspondingly. The voltage threshold Vdg min. (charge) (Voltage diesel generator minimum (charge)) defines how much load can be placed on the generator. The nominal voltage of the diesel generator is thereby reduced by 10% and set as voltage threshold Vdg min. (charge) (Voltage diesel generator minimum (charge)) by the Conergy ISA configurator.

CAUTION! Incorrect settings endanger your diesel generator!

In the case of diesel generators, one cannot always clearly recognise up to which voltage threshold they may be loaded.

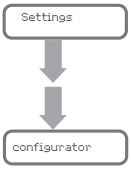
Check with the manufacturer of the diesel generator before you set the voltage threshold.

Display text	Function
Vdg min. (charge) (Voltage diesel generator minimum (charge))	Voltage threshold up to which the diesel generator can be loaded



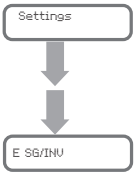
If you wish to improve the action of the Conergy ISA hybrid or Conergy ISA backup inverter with the solar generator, you can adapt the MPPT window (from MPPT range start to MPPT range end). This voltage window is searched at regular intervals (MPPT delay) to find the current MPP (maximum power point). These settings depend on the specific conditions of your system, and you must carefully calculate them.

Display text	Function
MPPT range start	Lower voltage threshold of the MPPT window
MPPT range end	Upper voltage threshold of the MPPT window
MPPT delay	Waiting time between the MPPT sequences



The sub-menu configurator with the option Language offers you the possibility settings between a German and English display text.

Display text	Function
Language (Display language)	Language of the display text



If you replace your system with a new one, you can use your Conergy ISA configurator to monitor and configure the new system as well. In this case, Conergy recommends resetting the values of the energy counter in the sub-menu E SG/INV (E SG/WR).

Display text	Function
Edc solar/kWh	Energy quantity that the solar generator supplies

Display text	Function
Edc off-grid/kWh	Energy quantity required by the consumers
Edc grid/kWh (Eac grid/kWh)	Energy quantity that the diesel generator supplies

5.3.1 Change of values in the main menu Settings

In the main menu Settings, change the values with the keys:

Key	Assignment
Enter	Confirm current setting; change into the entry mode (cursor flashes)
Esc	Change to the next higher menu level
Down	Move cursor to the left; Reduce number by one digit
UP	Move cursor to the right; Increase number by one digit
UP + Down	Select the number to be changed (number is underlined)

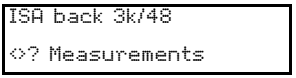
Example **Changing in the voltage threshold at which the inverter is switched off.**

For example, you want to change the voltage threshold Bat. cut off (Battery switch off) from the standard value 43.8 to 45.8 V. You have taken the value 45.8 from your battery's characteristics data.

Requisites Voltage threshold Bat. low (Battery low) > 46.8 V

Voltage threshold U on (U on, switch-on threshold) > 47.8 V

Starting point is the initial setting of the display when you switch on the Conergy ISA configurator:



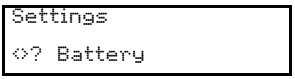
Change of voltage threshold

1. Press UP

Menu change to the Settings option

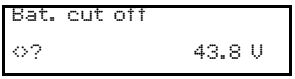
2. Press [Enter]

Menu change to the sub-menu Battery



3. Press [Enter]

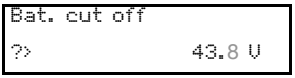
Menu change to the option Bat. cut off



4. Press [Enter]

Change to the change mode

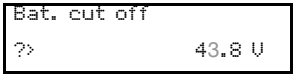
Cursor flashes on the right number (depicted in grey)



5. Press [UP]

Cursor moves to the left to the next number

Cursor flashes on the corresponding number (depicted in grey)



6. Press [UP] + [Down] simultaneously

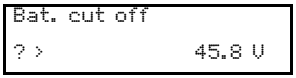
The number to be changed is selected and underlined

7. Press [UP]

The value of the number increases by one position; it remains underlined

8. Press [UP]

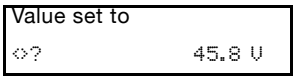
The desired number 5 appears



9. Press Enter

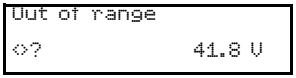
The change mode is ended,

Confirmation of the change is displayed briefly:



Then the menu option appears with the changed setting:

If, for example, you have typed incorrectly or your change is outside the possible setting range, you will briefly see a remark on the display:



Then the display again shows the option you selected, for example, Bat. cut off.

With Esc, you can cancel the entry at any time and change into the next higher menu level.

6 Appendix

Setting options dependent on the inverter and battery size

ISA 3000 hybrid with a 48 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting[2]
Bat. cut off	[V]	44	48	44	
Bat. low	[V]	45	52	46	
U On	[V]	46	56	50	
Bat. float charge	[V]	48	72[4]	56[5]	
Bat. gas. charge	[V]	48	72[4]	58[5]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat.temp. coeff.	[mV/°C]	0	432	72	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	48	72[4]	58[5]	
Bat. overvolt.	[V]	48	72[4]	58[5]	
DG start volt.	[V]	0	72	06	
DG stop volt.	[V]	0	72	07	
MPPT window[3]	[V]	44	150,0	58–108	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

[5] The value holds for wet batteries; for dry batteries, the value is about 1 V lower.

[6] The number 0 means that the diesel generator is switched on at U On. The set value must be higher than the threshold U On.

[7] The number 0 means that the diesel generator is switched off for Bat. float charge. The set value must be lower than the threshold Bat. float charge.

ISA 5000 hybrid with a 120 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting [2]
Bat. cut off	[V]	110	121	110	
Bat. low	[V]	112	133	115	
U On	[V]	114	145	126	
Bat. float charge	[V]	121	180[4]	141[5]	
Bat. gas. charge	[V]	121	180[4]	145[6]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat. temp. coeff.	[mV/°C]	0	1080	180	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	121	180[4]	145[6]	
Bat. overvolt.	[V]	121	180[4]	145[6]	
DG start volt.	[V]	0	72	0[7]	
DG stop volt.	[V]	0	72	0[8]	
MPPT window[3]	[V]	90,0	350,0	145–311	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

[5] The value holds for wet batteries; for dry batteries, the value is about 2 V lower.

[6] The value holds for wet batteries; for dry batteries, the value is about 4 V lower.

[7] The number 0 means that the diesel generator is switched on at U On. The set value must be higher than the threshold U On.

[8] The number 0 means that the diesel generator is switched off for Bat. float charge. The set value must be lower than the threshold Bat. float charge.

ISA 10,000 hybrid with a 120 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting[2]
Bat. cut off	[V]	110	112	110	
Bat. low	[V]	113	115	113	
U On	[V]	120	128	126	
Bat. float charge	[V]	121	180[4]	131[5]	
Bat. gas. charge	[V]	121	180[4]	145[6]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat. temp. coeff.	[mV/°C]	0	1080	180	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	121	180[4]	145[6]	
Bat. overvolt.	[V]	121	180[4]	145[6]	
DG start volt.	[V]	50	120	90	
DG stop volt.	[V]	50	120	90	
MPPT window[3]	[V]	90,0	350,0	145–311	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

[5] The value holds for wet batteries; for dry batteries, the value is about 2 V lower.

[6] The value holds for wet batteries; for dry batteries, the value is about 4 V lower.

ISA 20,000 hybrid with a 120 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting[2]
Bat. cut off	[V]	110	112	110	
Bat. low	[V]	113	115	113	
U On	[V]	120	128	126	
Bat. float charge	[V]	121	180[4]	131[5]	
Bat. gas. charge	[V]	121	180[4]	145[6]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat. temp. coeff.	[mV/°C]	0	1080	180	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	121	180[4]	145[6]	
Bat. overvolt.	[V]	The value cannot be set		345	
DG start volt.	[V]	50	120	90	
DG stop volt.	[V]	50	120	90	
MPPT window[3]	[V]	90,0	350,0	145–311	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

[5] The value holds for wet batteries; for dry batteries, the value is about 2 V lower.

[6] The value holds for wet batteries; for dry batteries, the value is about 4 V lower.

ISA 30,000 hybrid with a 240 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting [2]
Bat. cut off	[V]	222	233	222	
Bat. low	[V]	231	242	231	
U On	[V]	239	263	252	
Bat. float charge	[V]	251	275[4]	264[5]	
Bat. gas. charge	[V]	270	300[4]	282[6]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat. temp. coeff.	[mV/°C]	0	2160	360	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	121	180[4]	145[6]	
Bat. overvolt.	[V]	The value cannot be set		345	
DG start volt.	[V]	220	300	238	
DG stop volt.	[V]	220	300	276	
MPPT window[3]	[V]	300	600	360–460	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

[5] The value holds for wet batteries; for dry batteries, the value is about 2 V lower.

[6] The value holds for wet batteries; for dry batteries, the value is about 4 V lower.

ISA 3000 backup with a 48 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting [2]
Bat. cut off	[V]	44	48	44	
Bat. low	[V]	45	52	46	
U On	[V]	46	56	50	
Bat. float charge	[V]	48	72[4]	56[5]	
Bat. gas. charge	[V]	48	72[4]	58[5]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat. temp. coeff.	[mV/°C]	0	432	72	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	48	72[4]	58[5]	
Bat. overvolt.	[V]	48	72[4]	58[5]	
DG start volt.	[V]	0	72	0[6]	
DG stop volt.	[V]	0	72	0[7]	
MPPT window[3]	[V]	44	150,0	58–108	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

[5] The value holds for wet batteries; for dry batteries, the value is about 1 V lower.

[6] The number 0 means that the diesel generator is switched on at U On. The set value must be higher than the threshold U On.

[7] The number 0 means that the diesel generator is switched off for Bat. float charge. The set value must be lower than the threshold Bat. float charge.

ISA 5000 backup with a 120 V battery

Menu option	[Unit]	Min.	Max.	Standard value[1]	Your setting [2]
Bat. cut off	[V]	110	121	110	
Bat. low	[V]	112	133	115	
U On	[V]	114	145	126	
Bat. float charge	[V]	121	180[4]	141[5]	
Bat. gas. charge	[V]	121	180[4]	145[6]	
Bat. low time	[s]	5	255	10	
Bat.gas time	[min]	30	1000	120	
Bat. temp. coeff.	[mV/°C]	0	1080	180	
Bat. tmp. high	[°C]	-10	70	55	
Bat. equal. volt.	[V]	121	180[4]	145[6]	
Bat. overvolt.	[V]	121	180[4]	145[6]	
DG start volt.	[V]	0	72	0[7]	
DG stop volt.	[V]	0	72	0[8]	
MPPT window[3]	[V]	90,0	350,0	145–311	

[1] Standard values are the factory settings of the Conergy ISA standalone inverter.

[2] Here you can note your settings.

[3] MPPT window: Voltage window from MPPT range start to MPPT range end

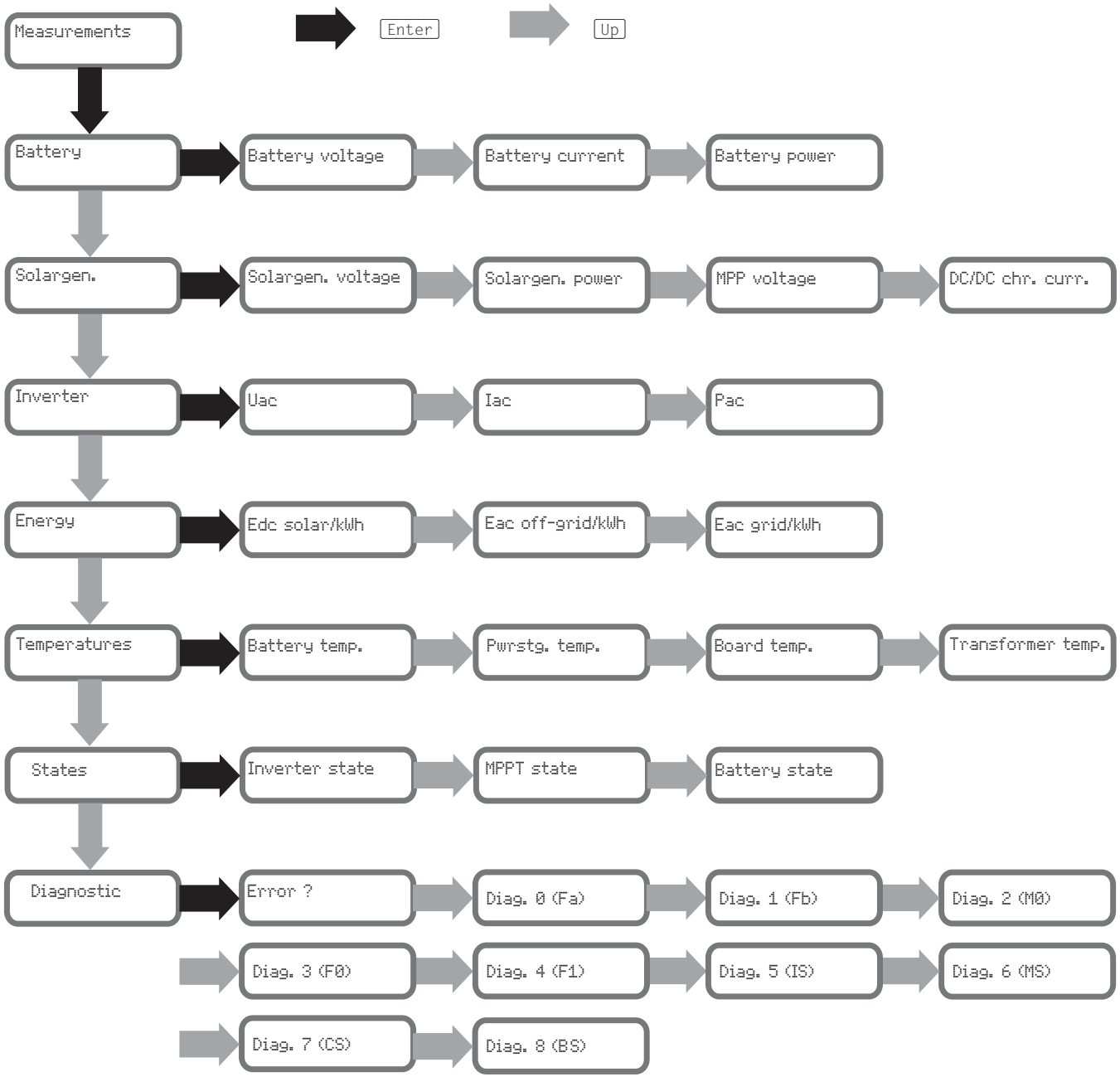
[4] This value can only be chosen if the battery manufacturer has approved the voltage of 3 V per cell.

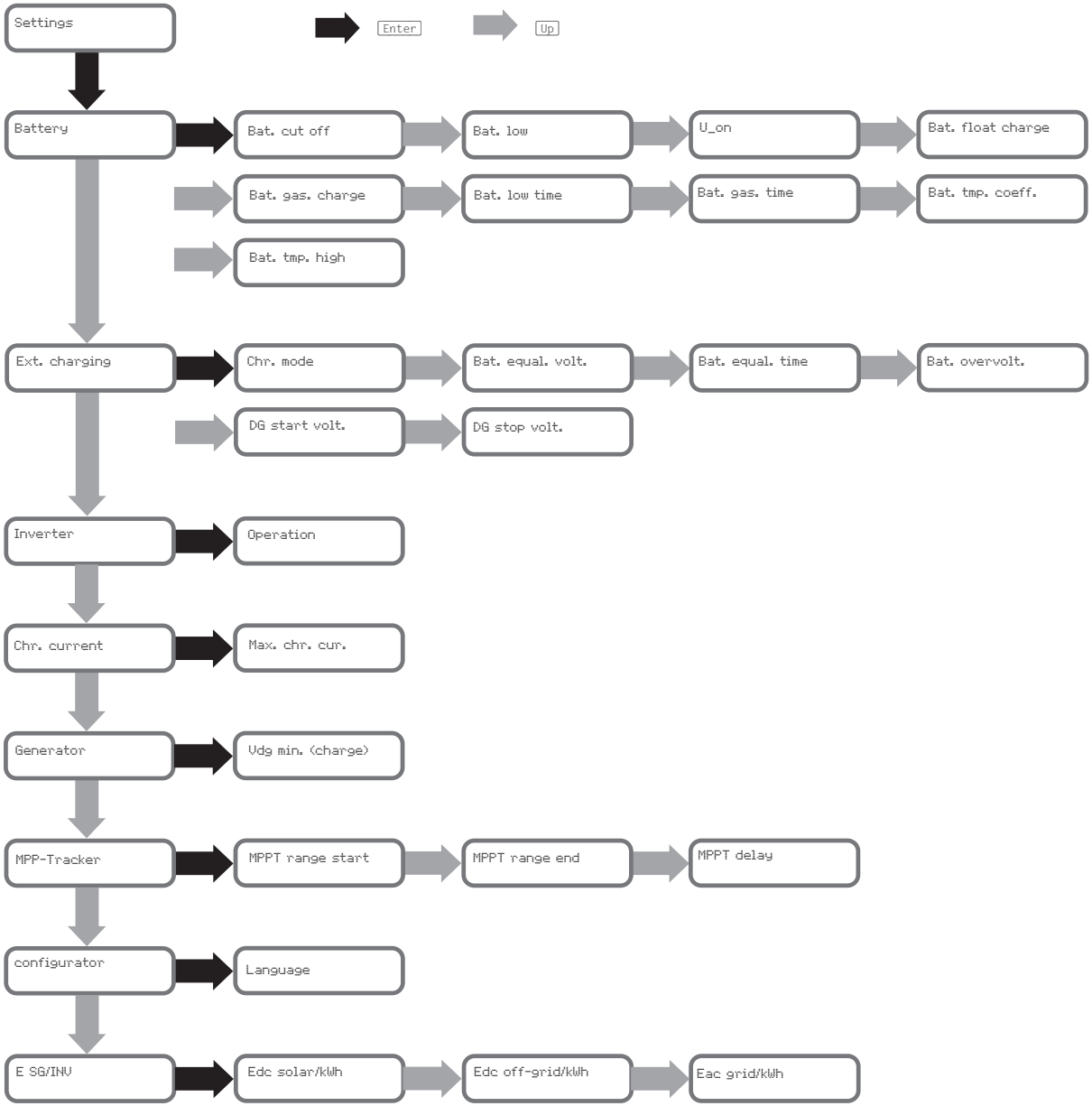
[5] The value holds for wet batteries; for dry batteries, the value is about 2 V lower.

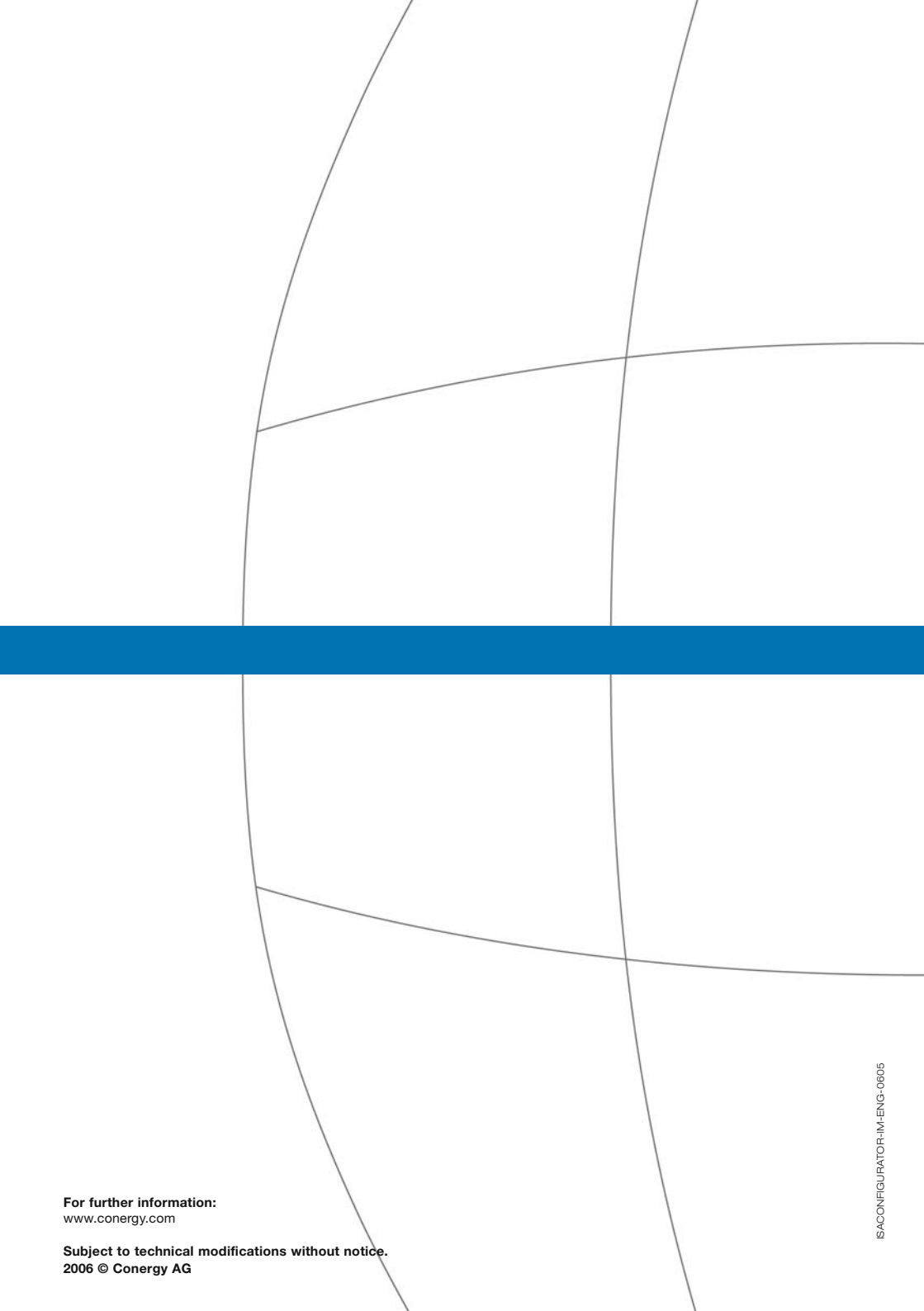
[6] The value holds for wet batteries; for dry batteries, the value is about 4 V lower.

[7] The number 0 means that the diesel generator is switched on at U On. The set value must be higher than the threshold U On.

[8] The number 0 means that the diesel generator is switched off for Bat. float charge. The set value must be lower than the threshold Bat. float charge.


Measurements
Enter
Up
Battery
Battery voltage
Battery current
Battery power
Solargen.
Solargen. voltage
Solargen. power
MPP voltage
DC/DC chr. curr.
Inverter
Uac
Iac
Pac
Energy
Edc solar/kWh
Eac off-grid/kWh
Eac grid/kWh
Temperatures
Battery temp.
Pwrstg. temp.
Board temp.
Transformer temp.
States
Inverter state
MPPT state
Battery state
Diagnostic
Error ?
Diag. 0 (Fa)
Diag. 1 (Fb)
Diag. 2 (M0)
Diag. 3 (F0)
Diag. 4 (F1)
Diag. 5 (IS)
Diag. 6 (MS)
Diag. 7 (CS)
Diag. 8 (BS)


Settings
Enter
Up
Battery
Bat. cut off
Bat. low
U_on
Bat. float charge
Bat. gas. charge
Bat. low time
Bat. gas. time
Bat. tmp. coeff.
Bat. tmp. high
Ext. charging
Chr. mode
Bat. equal. volt.
Bat. equal. time
Bat. overvolt.
DG start volt.
DG stop volt.
Inverter
Operation
Chr. current
Max. chr. cur.
Generator
Vdg min. (charge)
MPP-Tracker
MPPT range start
MPPT range end
MPPT delay
configurator
Language
E SG/INV
Edc solar/kWh
Edc off-grid/kWh
Eac grid/kWh



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www.conergy.com

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